the Congo. Cannibalism is in his experience in this region almost universal, on the increase, and peculiarly inveterate. An extensive traffic in human flesh prevails, and slaves as well as prisoners are kept and sold for food. Even corpses are disinterred in spite of charms on the graves; the flesh is always cooked or smoked, but is not here eaten from any religious or superstitious motive. The practice of filing the front teeth is not found to be coextensive with that of cannibalism.

Mr. Darnell Davis derived the name "cannibal" from the Caribs of the West Indies, who, however, are not man-eaters; Mr. Elworthy discussed the theory of cannibalism as a means to acquire the properties of the thing eaten; and Mr. Hartland the survivals, in Europe, of ceremonial and sepulchral cannibalism.

Captain Hinde also described the pigmies of Central Africa, nomadic hunters, of less than four feet stature.

Mr. A. Montefiore gave an account of the Samoyads of the Arctic Tundras.

Reports were presented by the Committees on physical deviations of children from the normal, and on anthropometric measurements in schools.

The anthropometric laboratory, which is usually organised during meetings of the Association, was not this year available.

On Monday, Mr. Elworthy read a paper on horns of honour, dishonour, and safety. The head is the object of honour, and is adorned with symbolic attributes. Horns are symbolic of the crescent-goddess; so of divine power, protection and favour in general. Conversely, to "scorn" (French *écorner*) is to deprive of such horns and prestige. The paper gave rise to some comment. Not all horns are crescent-symbols; most were originally worn attached to skins; ornaments are decorative first, symbolic afterwards.

Mrs. Grove discussed the religious origin of dances, as forms of magic or worship. Weapon-dances arise from worship of weapons, or of an armed deity; ritual dances from the love of dancing attributed to the deity, and as the expression of exalted enthusiasm; funeral dances propitiate either death, or the departed soul. As civilisation advances, the expressions of emotion are restrained, and dances lose their meaning and popularity.

The report of the Ethnographic Survey of the United Kingdom was read by Mr. Hartland, who was followed by Mr. J. Gray with observations specially relating to East Aberdeenshire, and by Dr. Garson with similar results from Suffolk. Work has also been begun in Hertfordshire and East Anglia (by the Cambridge Sub-Committee), and is projected in Galloway, and in Caithness, Elgin, and Nairn, by Dr. Walter Gregor.

Mr. C. G. de Betham read a fully illustrated paper on the peculiarities of the Suffolk dialect, which retains an unusual number of Anglo-Saxon idioms; and on the proverbs, traditions, and folk-medicine of the district. Mr. Lingwood exhibited two young ash-trees from Needham Market, which had been split in order to pass sick children through the stem.

Mr. Clodd read a paper on the objects and method of the study of folk-lore, which was followed by a lantern lecture by Prof. A. C. Haddon, on the same subject, exhibiting a series of persons, trees, wells, and other natural objects and prehistoric monuments to which traditions are attached, and illustrating a number of games and ceremonies, in which primitive beliefs and practices are perpetuated.

On Tuesday a formal discussion took place on the results of interference with the civilisation of native races. The subject was briefly introduced by the President, and papers were contributed by Lord Stanmore, Prof. A. C. Haddon (New Guinea), Dr. Cust (India), Dr. H. O. Forbes (Dutch East Indies), Messrs. E. Im Thurm and Darnell Davis (British Guiana), Ling Roth (Tasmania and Australia), and Raynbird (Central India). The course of the debate was summed up by the President as follows. The principle of government should be to protect the natives against their own weakness, the evil influences of debt, and the loss of their land. Rigorous impartiality may be the greatest injustice to the natives, and it is only by dealing with them from their own sense of justice that influence can be obtained. Native customs should not be unnecessarily interfered with, and then only with careful attention to the native point of view. Laws of morality differ in various countries, and what is "right" here is "wrong" there. Changes of detail should be left to the change of native opinion, rather than be enforced by law. It is, for instance, as cruel and disastrous to dress a native of a jungle in our tight, ill-ventilated clothes, as to expose an European naked in a tropical climate. With regard to education, opinions seem to differ; the completely savage brain cannot acquire our ways of thought suddenly without excessive strain and enfeeblement; but native races differ very widely in receptivity and imitativeness. What is above all things necessary is that sympathy of fellow-feeling which at once places one man on an easy and equal footing with another, and which savage races are very quick to perceive and reciprocate.

Rev. Hartwell Jones followed with a philological contribution to the history of primitive warfare in Greece and Italy.

Dr. Garson described a skull found in Thames Valley gravel, which contains palæolithic implements, and claimed it as palæolithic on morphological grounds; supported by Mr. Stopes. Sir John Evans, Prof. Boyd Dawkins, and Mr. Myres disputed the attribution.

A large collection was exhibited of photographs illustrative of the Andamanese and their civilisation, sent by Mr. Maurice Portman.

On Wednesday, Dr. Munro gave a fully illustrated lantern lecture on the newly discovered Neolithic settlement at Butmir in Bosnia. Flint and jasper weapons were manufactured in great variety on the spot, while polished hammers and axes were brought from a distance; and black pottery, with elaborate incised angular ornaments, was extensively made. A principal feature in the site is the occurrence of irregular depressions in the basal clay below the débris. Continental observers considered these to be the floors of huts; but Signor Pigorini and Dr. Munro found traces of piles, and argued that the houses were pile-dwellings, and that the hollows were made to obtain clay for wattle-work and pottery. Sir John Evans supported the pile-dwelling theory, and suggested that dredging might explain the irregularity of the hollows.

Mr. A. J. Evans described a series of primitive European idols, with diagrams and exhibits. Beginning with the marble images of the Greek archipelago, he sketched the area over which kindred figures occur, in Italy, Sicily, Spain, Liguria; and thence into Central Europe and the shores of the Baltic, and even as far as Orkney. The Oriental origin of these figures, formerly maintained, is now strongly contested; they probably testify to an indigenous practice of burying at first actual, and subsequently substituted attendants with deceased persons. Prof. Petrie compared the Maltese seated figures with those of the "New Race" in Egypt.

Dr. Munro presented a further report on the Lake Village of Glastonbury. Amongst the relics found were examples of pottery which were, undoubtedly, highly ornamented specimens of late Celtic art. Other articles unearthed must have been imported two or three centuries before the Roman occupation. Prof. Boyd Dawkins regarded the evidence as conclusive that the Lake Village of Glastonbury might be dated from 200 B.C. to the time of the Roman occupation.

Mr. Theodore Bent contributed a paper on the natives of Southern Arabia.

The Section was closed with a hearty vote of thanks to the President.

MECHANICS AT THE BRITISH ASSOCIATION.

SECTION G, which is devoted to mechanical science, had an unusually heavy programme at the late Ipswich meeting; indeed it was rather too heavy for the majority of members, for often the proceedings were carried on before a very scanty audience. It is a question whether, in this Section at any rate, a good deal of judicious weeding could not be done. Of course it is understood that "mechanical science" shall be translated as engineering in general—and that is a very good thing, as otherwise many good papers on what is generally known as "civil engineering" would be shut out from the Association altogether—but with a most benevolent desire to give all branches of applied science a hearing, one cannot help thinking it would be an advantage to every one concerned—especially the authors—if some proffered contributions were returned with thanks. The fact is, an exercise of the selective faculty, and perhaps a little more callousness to the demands made by the sensitiveness of authors, would do much towards rendering the proceedings in Section G more bearable than they have been for some time past.

There was, however, a good deal that was interesting and distinctly valuable in the proceedings of the Section at this year's meeting. The pity was that it should have been often wasted on an all but empty room. Another cause of complaint on the part of members of this Section was that the second Wednesday was a *dies non*. Doubtless very few object to a whole holiday at these meetings, but what people do find fault with is that they should be kept hard at work on Saturday, when there are pleasant excursions, to be turned adrift on Wednesday. Of course one can go home and cut the business short, and that is what many do, and the Thursday's excursions thus suffer. Indeed a conscientious member, determined to do his Section G thoroughly, was unable to go to any of Saturday's excursions, and would have to spend an idle day waiting for the Thursday's excursions. The excursions are the great feature of the Association meetings, as they bring members together and make them known to each other in a way that no other institution or society does. Possibly more has been done for the Advancement of Science by such means than by the meetings of Sections, for there are other associations which afford opportunities for the reading and discussion of papers, but none which offer the same social facilities as the British Association. When it is remembered that only two Sections met on the second Wednesday, it is a question whether it would not be of advantage to make it a rule to fix the whole day excursions for Wednesday instead of Thursday. We are aware that this would create difficulties in regard to meetings of general committees, but surely these could be overcome.

The President of Section G this year was Prof. L. F. Vernon-Harcourt, who opened the proceedings of the Section by reading his presidential address.

The first paper taken was a contribution by Major-General Webber, on light railways as an assistance to agriculture. It contained the main elements of a scheme which the author had thought out for introducing a system of light railways in Suffolk. A good deal of attention was given to the subject of gauge, which the author considered should be narrower than the standard gauge of the country, viz. 4 ft. 8½ in. There is much to be said in favour of a narrow gauge for auxiliary railways, but also much to be said against it. No doubt a narrow gauge is cheaper than a wider one, but perhaps not so much cheaper as many persons imagine. Sharper curves can also be taken with a narrow gauge, and it can be laid in position where often the broader gauge would necessitate the widening of the road. On the other hand, the standard gauge enables the waggons and trucks of the trunk lines to be run on the auxiliary railways. It may be said that a light railway demands—on the score of cheapness—that the road bed shall be of a less substantial character than that of the trunk lines; but here it is essential to bear one fact in mind. The massive permanent way of our trunk lines is required for the heavy locomotives running at high speed. With small engines and comparatively slow speed very light permanent way will carry the ordinary railway goods stock with safety. The first thing, however, which has to be done in order to facilitate the introduction of auxiliary railways in this country, is to give power to the Board of Trade to relax its own regulations.

A paper by M. A. Gobert, of Brussels, on a freezing process for shaft-sinking, was next read. In general principle the suggestion is not new. In cases where water-bearing strata is encountered in shaft-sinking, a freezing medium is caused to circulate in pipes. The vehicle used is ammonia, which, evaporating in the pipes, produces the freezing effect.

The next paper read was of considerable interest; it was a memoir by Mr. W. H. Wheeler, of Boston, on the effect of wind and atmospheric pressure on the tides. For many years past the author has been making observations on this subject. From an analysis of two years' tides at the Port of Boston, (excluding occasions when the element of wind would affect the case), he found that out of 152 observations, 61 gave results opposite to that which would have been expected by the readings of the barometer alone; for a high barometer was frequently accompanied by a high tide, and a low barometer by a low tide. On the other hand it was found, with few exceptions, that when the wind blows with any force along a coast in the same direction as the main stream of the flood tide, the tides at all the ports along the coast will be higher than the calculated height given in the tide-tables; and when the wind blows against the flood tide, high-water will be lower than calculated. According to figures quoted in the paper, the effect of wind is such as to affect the tide as much as 5 to 6 feet, and a difference of as much as 8 feet has been observed between two succeeding tides. An analysis of the register of tides at Boston Dock for two years showed that 24 per cent. of the whole tides recorded were sufficiently affected by the wind to vary 6 inches from the calculated height. Thirty varied by 2 feet, seven by 3 feet, six by 3½ feet, three by 4 feet, two by 4½ feet, one by over 5 feet, and one by 6 feet 3 inches. From the observations he has made, Mr. Wheeler has deduced the approximate rule that with a given force of wind of 3 on the Beaufort scale a tide will be raised or depressed by half an inch for every foot of range. With a force of from 4 to 6, the variation may be expected to be 1 inch for every foot, with a gale from 7 to 8 it will be 1½ inches, and if the gale increases to 10 it will be 2 inches. It will be seen that the subject is one which possesses not only scientific interest, but considerable practical importance to mariners; and so far as we are aware, Mr. Wheeler is the first who has obtained quantitative results of this nature. In the discussion which followed, it was pointed out that the time element would have to be given its due value.

At the second sitting of the Section, on Friday, the 13th ult., Mr G. J. Symons gave what was really a lecture on the autumn floods of 1894. This contribution was discussed together with a paper by Messrs. Rapier and Stoney, on weirs in rivers. Any contribution by Mr. Symons is sure to meet with a good reception at a meeting of the Association, and Mr. Stoney's work in connection with river engineering is also so well known, that it was not surprising that the attendance in the Section should be a full one when the sitting opened. The floods of November of last year, it will be remembered, were of an unusually severe character, a great part of the low-lying lands of the Thames Valley being submerged. The meteorological conditions which led to these floods were traced by Mr. Symons, and the effects stated. With regard to the latter, it would be but to repeat a long history of flooded homes, spoiled furniture, and general damage to property. The extent of course will never be known, but it was sufficient to be accounted a calamity of considerable magnitude. There were two periods of heavy rainfall quickly succeeding each other, but it was the second which was the immediate cause of damage; the first, if it had stood alone, would have been comparatively innocuous. The first period occurred at the end of October, and nearly all the additional land water caused by it had passed over Teddington Weir before the second period arrived. The November rains, however, found the earth well saturated, and the water that fell ran therefore almost wholly into the river bed, with the unfortunate results before referred to. The moral Mr. Symons chiefly strove to impress was the necessity of automatic records and communication between different divisions of a water-shed, so that prompt warning might be given of a probable flood. Such precautions are taken by continental nations, but in England they are sadly neglected. The necessity for obtaining accurate data, and treating it in a systematic and scientific manner by trained observers, was well illustrated by instances given; for example, the river Mole was at its highest four days before the Thames, and if the warning thus given by nature had been heeded, much of the damage which followed might have been prevented.

The second paper gave a good description of the movable weirs which have become identified with Mr. Stoney's name, and which were so prominently brought before public notice in connection with the Manchester Ship Canal. A more recent example, and one which is better known to Londoners, is that at Richmond, where there is a half-tide lock and a series of lifting weirs. It has been claimed that if many of the fixed weirs in the Thames were removed, and these lifting weirs substituted for them, that there would be less danger from flooding of the river. How far Messrs. Rapier and Stoney go in this direction we did not gather from the paper, but such we took to be the general drift of their argument. The position was disputed during the discussion which followed, it being maintained by some speakers that even if the flow of water were absolutely unimpeded as far as Teddington Weir, the tidal portion of the river-channel is not of sufficient section to carry off all water that comes down in time of heaviest rainfall. The question is complicated by the ebb and flow of the tide, but it ought not to be impossible to arrive at a fairly definite conclusion. The matter is one which wants investigation by a competent authority, for we did not notice that any more than general statements were made in support of the alleged insufficiency of the tidal channel; and the statements, therefore, did not appear to rest on a substantial basis of fact. The problem of the utilisation of the head of water at the weirs in the Thames was also brought forward. Without going into details, it may be said that the discussion tended to show that there is little probability of any useful work being done in this direction unless some entirely new departure in the construction of turbines be discovered, Mr. Stoney, however, in his reply to the discussion, gave a sketch of a very ingenious device by which he proposed to increase the available head in the case of its diminution by the rise of water in a river. We think, however, that something more than this will be needed before the Thames weirs become commercially successful as a source of power.

Dr. Anderson described a rotating fan he had devised, to be used in place of bellows for organ-blowing. The application was successful, as might be supposed in the case where a volume of air, large in comparison with its velocity, was required to be set in motion. A paper by Mr. Birt, on the growth of the port of Harwich, was interesting from a commercial and economic point of view, and may be taken in conjunction with a note by the President, on the Hook of Holland route.

A description of a railway up Snowdon, which is in course of construction, brought the proceedings of the day to a close.

On Saturday the proceedings commenced with the presentation of two reports by Committees of the Section; the first on standardising, and the second on coast erosion. The standardising report was of an interim character, and does not require extended notice, in prospect of being brought forward again. The coast erosion report was also presented in another Section. Mr. A. G. Lyster gave a long description of the dredging operations now going on at the mouth of the Mersey to reduce the bar which has too long been allowed to impede the navigation of our great Atlantic port.

A paper by Mr. E. Hesketh, describing a process of refrigerating by carbonic anhydride, was next taken. This was a very interesting contribution, and afforded a good example of the type of paper that should be presented to the Section. It does not, however, lend itself very easily to our present purpose, as it consisted mainly of details of construction of the machinery, which, though highly interesting, it would be impossible for us to make clear without the many illustrations by which the author explained his meaning. Another good and characteristic paper was contributed by Mr. J. Napier, who described an installation that has been carried out at Ipswich of the Hermite process of purifying sewage. Briefly stated, the process consists of passing an electric current through sea-water. A part of the chlorides is converted into hypochlorite, and a deodorising agent is thus obtained. The electrolysed water is passed into the drains or sewers. The system, if worked to the full extent, as proposed by the inventor, would consist of having a separate service of the electrolysed water laid on for use in closets, house drains, &c. The system has been in use but a short time in Ipswich, and is said to promise very favourably by those who have been connected with its working.

The Monday of the meeting is always devoted by Section G to electrical engineering, and at the recent meeting the proceedings on that day, the 16th ult., were opened by a long paper from the pen of Mr. Philip Dawson, on the modern application of electricity to traction purposes. Mr. Dawson has evidently travelled much in the United States, and has there collected a vast amount of data bearing on the subject of his paper. To attempt to follow him into the details he gave in his paper would be hopeless in this report. He is a strong advocate of the trolley system of transmission, holding that it will supersede all others; and indeed experience in America goes far to bear him out in this. It is needless here to point out how great has been the progress made in the United States in tramway propulsion by electricity; but one fact stated at the meeting may be repeated, as it puts the whole matter very forcibly. It was said that it is becoming a great problem what is to be done with the horses that are being pushed out of the field by electricity. In some places they are being killed for the sake of their hides and tallow; whilst in other districts good horses were to be bought at two dollars each. The latter figure we think may be open to question, for surely a dead horse is worth more than two dollars. However, there is no doubt that electric traction has made immense strides in America, and has in great cities practically supplanted not only the horse and mule, but is fast edging out its mechanical rivals the cable and steam engine.

The next item on the agenda was a paper by Messrs. Preece and Trotter, on an improved portable photometer. This paper was listened to with great interest; Mr. Trotter illustrating his remarks by examples of the different forms and apparatus he had devised for street work. The paper began by a definition of what is meant by illumination. When light falls upon a surface, that surface is said to be illuminated. The illumination depends simply upon the light falling on the surface, and has nothing to do with the reflecting power of the surface, just as rainfall is independent of the nature of the soil. It depends also on the cosine of the angle of incidence. The lighting of streets and of buildings may be specified by the maximum and minimum illumination. The primary purpose of an illumination photometer is to measure the resulting illumination produced by any arrangements of lamps irrespective of their number, their height, or their candle-power. The instrument under notice consisted of a box, on the upper surface of which is a diaphragm of white card painted with a whitewash of magnesia and isinglass. It has one or more star-shaped perforations. Immediately below it, within the box, is a white screen capable of adjustment at different angles and two small electric lamps of different candle-power, either or both of which can be used. A portable secondary battery is used to supply them with current. The illumination of the hinged screen inside the box varies approximately as the cosine of the angle of incidence of the light from the electric lamps upon it. A handle with a pointer moving over a graduated scale is connected to the screen with a system of levers, and the inclination is so adjusted that the illumination of the screen is equal to that of the perforated diaphragm, the perforations seeming to disappear when this balance is affected. The illumination can then be read off on the scale in units of the illumination due to one standard candle at one foot distance. The object of the levers is to give an open and convenient scale. The scale is graduated by experiment, and does not depend upon the the cosine law. The colour difficulty, where arc light or daylight is to be measured, is reduced by the use of a yellow-tinted diaphragm and a blue-tinted screen, the tints being selected so that the readings are the same as the mean of a large number of measurements made with white screens. By means of a graduated quadrant and a gnomon the angle and the cosine of the angle of incidence of the light from a lamp may be measured. Rules are given for deducing the height of the lamp and the slant height, and hence the candle-power of the lamp.

The discussion on this paper was of a very brief nature, and elicited no new facts of importance.

Mr. H. A. Earle read a paper on storage batteries, dealing chiefly with the chloride battery which has lately been introduced, and which, it is claimed, possesses the advantages of other and earlier types without many of the attendant disadvantages, chiefly from the fact that an oxide paste is not used. A mixture of chloride of lead and chloride of zinc is cast into small tablets, which have cast round them at high pressure a frame of antimonious lead. The subsequent elimination of the chloride and zinc leaves a porous structure of pure lead of a crystalline nature, good conductivity, and with a large surface exposed to the electrolyte. The result is a large capacity for a given weight and space occupied.

At the last sitting of the Section, held on Tuesday, the 17th ult., nine papers were read and discussed. We must deal with these very briefly. The first was by Mr. P. V. Luke, and was entitled "the field telegraph in the Chitral campaign." It was of a popular nature, and was illustrated by magic lantern. Mr. G. Johnstone Stoney explained, by the aid of the apparatus itself, a movement designed to attain astronomical accuracy in the motion of siderostats. Without the aid of diagrams it would not be possible to explain the mechanism, and we will leave it therefore for the present. A paper by Mr. F. W. Turner explained the modern process of preparing flour from the wheat berry by means of metal rollers in place of the old millstones. The paper was very interesting and treated the whole subject throughout, illustrations of the various machines used being hung on the walls. Mr. J. Southward gave an interesting description of the Linotype process of printing, describing in detail and by the aid of illustrations the really wonderful machine which has been devised for the purpose. Mr. R. E. Crompton, in a memorandum on the B. A. screw gauge for small screws, pointed out the advantage that would follow if complete uniformity were observed among manufacturers in this matter, and dwelt on the desirability of a standard plate being provided for the purpose by the Board of Trade. Mr. John Key contributed a paper describing the differences in the practice of English and foreign Government departments and registration societies in their requirements for the provision for safety in marine boilers and engines. The want of uniformity here again is undoubted.

Lieut. B. Baden-Powell described a means he suggested for navigating the air by means of kites. He pointed out that as greater height above the surface of the earth is reached, the wind nearly always increases in force. At 1000 yards it often blows at three times the velocity that it does near the surface. He proposes to take advantage of this difference by sending one kite to the upper atmosphere, and keeping another nearer the ground. The two kites would be connected by a long line, and the weight to be carried would be attached to the line at a point nearer to the lower kite than to the higher. The lower kite would thus supply a retarding medium to the upper, so that the effect would be the same in principle, though not in degree, as if the upper kite were held to the earth by a string, and the lower kite were towed through the air by a boy running with the string in his hand. By the forces thus brought to bear both kites would be kept flying although not held to the earth by a string in the usual way, and it is thought that possibly they might be navigated in directions other than that in which the wind might be blowing. It will be seen that the author depends on the difference in velocity of currents of air at two heights; and were this difference to fail, or to become insufficient, the experimenter would come to the ground. This might prove awkward unless a clear field were provided for the descent. The suggestion however is ingenious, and no doubt many persons interested in the problem of aerial navigation would be pleased to see the author put his theories to the test of practice.

The last paper presented at the meeting was a contribution by Prof. A. E. Elliott, of Cardiff, on receiver and condenser drop. It is a subject that deserves far more consideration and discussion by members of the Section than they were able to give on hearing it read rapidly at the end of the meeting. Papers of this nature should be read at one meeting, and the discussions adjourned until another; or perhaps it would be better to distribute them two or three months before the meeting, and dispense with reading altogether. A joint meeting of Sections A and G would afford the appropriate audience for considering the subject of Prof. Elliott's memoir.

BOTANY AT THE BRITISH ASSOCIATION.

THE President (Mr. Thiselton-Dyer) exhibited photographs and specimens of a large cedar (*Cedrus Deodara*, Loud.) from Kew, which had been struck and completely shattered by lightning on August 10. It was pointed out that the main stem had been in part blown into matchwood by the violence of the shock, and branches were torn off with large portions of the trunk adhering to their base. Prof. Oliver Lodge took part in the discussion as to the probable explanation of the unusual nature of the explosion, which seemed to have been centrifugal, the stem having been disrupted from the centre, and not merely stripped superficially.

Prof. Bretland Farmer described a set of wax models illustrating the typical forms passed through, and the chief variations exhibited, by the chromosomes during the division of the nucleus in the spore-mother cells of plants. The wax employed is made of a mixture of one part of white wax, with five parts of paraffin, the melting point of which is about 50° C.

THALLOPHYTA.

Experimental studies in the variation of yeast cells, by Dr. Emil Chr. Hansen (Copenhagen). The author gave an account of his earlier and more recent investigations. Among the latter he especially dwelt on those in which, by one treatment, varieties were produced that gave more, and by another treatment less, alcohol than their parent cells. He pointed out that the observed variations could be grouped under certain rules. From his researches on the agencies and causes to which variation is due, he found that temperature was the most influential external factor.[1]

A false *Bacterium*, by Prof. Marshall Ward, F.R.S.

On the formation of bacterial colonies, by Prof. Marshall Ward, F.R.S.

On the structure of bacterial cells, by Harold Wager. In this paper an account was given of the present state of our knowledge of the cells of bacteria. Reference was made to the observations of Schottelius, Migula, De Bary, Bütschli, and others. The author showed that it is possible to demonstrate in the majority of bacterial cells the presence of two substances, one of which may be regarded as protoplasmic in nature, and a second, which stains deeply when acted upon by fuchsin and kindred staining substances, and which may be regarded as nuclear. It was pointed out that this nuclear substance does not possess the structure of nuclei in the cells of higher plants.

Note on the occurrence in New Zealand of two forms of Peltoid *Trentepohliaceæ*, and their relation to the lichen *Strigula*, by A. Vaughan Jennings. The *Trentepohliaceæ* which form epiphyllous cell-plates are at present known only from the tropics. They have been recorded from South America, India, Ceylon, and the East Indies, but not up to the present time from New Zealand. The author gave a summary of previous literature, and described two forms found by himself in New Zealand. (1) *Phycopeltis expansa*, sp. nov. This species forms wide-spreading yellow cell-plates on the leaves of *Nesodaphne*; it bears two kinds of sporangia, and is often associated with brown fungus hyphæ growing between the cell rows, but not affecting the growth of the alga. On the other hand, when attacked by different hyphæ, the result is the formation of the lichen *Strigula*, which in Ceylon was shown by Ward to have for its algal element *Mycoidea parasitica*, Cunn. (2) *Phycopeltis nigra*, sp. nov. On leaves of *Nesodaphne* and fronds of *Asplenium falcatum*. Two distinct varieties of this species were described. The plant is never attacked by fungus hyphæ, and never takes any part in lichen formation, even when on the same leaf with *Phycopeltis expansa* and the associated *Strigula*.

BRYOPHYTA AND PTERIDOPHYTA.

On a supposed case of symbiosis in *Tetraplodon*, by Prof. F. E. Weiss. The author exhibited specimens of *Tetraplodon* from the Cuchullin Hills in Skye, where it was found plentifully on animal excreta. In September he found many of the patches mixed with an orange-coloured *Peziza*, which did not appear to have in any way injured the moss plants. The rhizoids of the moss, however, contained in many cases fungal hyphæ closely resembling those of the *Peziza*, and though present in the cells of the moss, these latter did not seem to be injured by them. He suggested that this might be an instance of symbiosis; the moss, as in the case of other green plants, making use of the fungal hyphæ to obtain its nutriment from the organic material. The ultimate proof of such a case of symbiosis would, however, necessarily depend upon culture experiments, which he understood were now being made by another observer.

Remarks on the Archesporium, by Prof. F. O. Bower, F.R.S. Prof. Bower pointed out that the recognition of the archesporium as consistently of hypodermal origin cannot be upheld, and quoted as exceptions *Equisetum*, *Isoetes*, *Ophioglossum*, and especially the leptosporangiate ferns. He laid down the general principle that the sporangia, as regards their development, should be studied in the light of a knowledge of the apical meristems of the plants in question. Where the apical meristems are stratified, the archesporium is hypodermal in the usual sense; where initial cells occur, the archesporium is derived by periclinal divisions of superficial cells. Intermediate types of meristem show an intermediate type of origin of the archesporium. He cited as an illustrative case that of *Ophioglossum*, admitting that the hypodermal band of potential archesporium, which he had previously described, does not occur always or in all species. But so far from thus giving up the case for a comparison with *Lycopodium*, he holds that as *Ophioglossum* has a single initial cell in stem and root, it would be contrary to experience to expect or demand a hypodermal archesporium. (The details will shortly be published elsewhere, with illustrations.)

On the prothallus and embryo of *Danæa*, by G. Brebner. Mr. Brebner gave an account of the prothallus and sexual organs of *Danæa simplicifolia*, Rudge, as the result of investigations made on some material from the Botanic Gardens in British Guiana. He pointed out that there is a close similarity between the *Danæa* and the other two genera of the *Marattiaceæ*, *Angiopteris* and *Marattia*, of which the prothallus has been previously described. An interesting fact was noted as regards the prothallus rhizoids, which possess a distinctly septate structure, and so far resemble a moss protonema. Possibly similar septate rhizoids may be found in the other marattiaceous genera. The development of the antheridia of *Danæa* agrees in the main with that in *Marattia* and *Angiopteris*:

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[1] A fuller account of Dr. Hansen's work will be published in the *Annals of Botany*.